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PALEONTOLOGY.—*Shorter contributions to the paleontology of the Eocene of northwestern Peru: I, Solitary corals. II, Brachiopods. III, Foraminifer* Gypsina.[1] WILLARD BERRY, Johns Hopkins University. (Communicated by JOHN B. REESIDE, JR.)

I, SOLITARY CORALS

It has been my good fortune to find two species of solitary corals belonging to the genera *Flabellum* and *Balanophyllia* in a grayish-brown gritty, calcareous sandstone near Calita Sal, Department of Piura, Peru. Though these corals are not well enough preserved to deserve a specific name they are worthy of record as an interesting part of the fauna. I have correlated the sandstone with the Eocene (probably upper Eocene) Saman conglomerate[2] because of the occurrence with the corals of the brachiopod *Liothyrina peruviana* Olsson and the foraminifera *Orthophragmina* (*Discocylina*) *peruviana* Cushman, *O.* (*D.*) *salensis* W. Berry, *O.* (*Asteriacites*) *calita* W. Berry, and *O.* (*Asterodiscocylina*) *stewarti* W. Berry.

It is interesting to note in the Eocene of this area the occurrence of solitary corals associated with the larger foraminifera and a brachiopod, all forms usually considered indicative of fairly clear water. The matrix is rather coarse, the grains attaining a maximum diameter of 1 mm. There is, however, little evidence of sorting, for considerable fine silt or mud is present in the sediments. Some of the cement is calcareous and some of the specimens of *Liothyrina peruviana* are now geodes partly filled with calcite crystals.

[1] Received April 13, 1929.

[2] A. IDDINGS and A. A. OLSSON. *Geology of northwestern Peru.* Am. Assoc. Petr. Geol. Bull. **12**: 17. 1928.

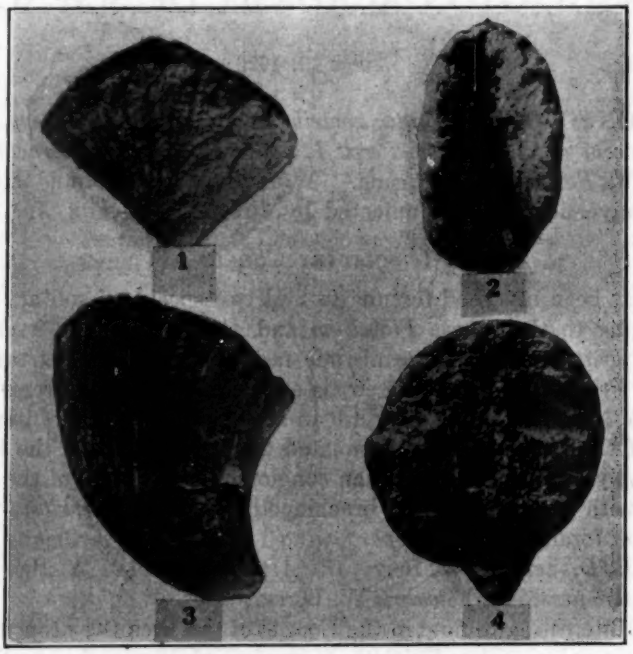
A. A. OLSSON. *Contributions to the Tertiary paleontology of northern Peru, pt. 1, Eocene Mollusca and Brachiopoda.* Bull. Am. Paleont. **14** (52). 1928.

The two corals may be described as follows:

FLABELLUM SP. (Figs. 1, 2)

Corallum attached by a very short pedicle; shape cuneate, compressed; no evidence of wing-like processes, nor of growth lines encircling the corallum. Costae well developed but fine. Septa not clearly shown, as the entire central portion of the corallum is obscured by matrix.

Greatest diameter, 14 mm.; least diameter, 8 mm.; height of corallum, 12 mm.



Figs. 1, 2.—*Flabellum* sp., × 3
Figs. 3, 4.—*Balanophyllia* sp., × 3

Locality: Near Calita Sal, Department of Piura, Peru.
Horizon: Saman conglomerate, Eocene.

I have not given this specimen a specific name because of the lack of knowledge of the septa. In external appearance it may be compared with *F. cuneiforme* var. *wailesi* Conrad, of the Jackson and Vicksburg formations in the Gulf Coastal Plain of the United States. However, the fossil presents so few of the internal features that comparisons are of small value.

BALANOPHYLLIA SP. (Figs. 3, 4)

Corallum elongate, cornute, curved in the plane of the longer transverse axis of the corallum. Costae fine, low, every second one more acute and larger

than the intervening one. Area of attachment small. Septa almost entirely obscured by matrix.

Greatest diameter, 14 mm.; least diameter, 12 mm.; height of corallum, 16 mm.

Locality: Near Calita Sal, Department of Piura, Peru.

Horizon: Saman conglomerate, Eocene.

I have not given this specimen a specific name because of lack of information concerning the interior characters. It may be compared with *B. irrorata* (Conrad) in the external features, but such a comparison has little meaning.

II, Brachiopods

The gritty, brown sandstone near Calita Sal, Department of Piura, Peru, has yielded four species of Brachiopoda, three of which appear to be new. The fourth is a species described originally by Olsson as *Liothyrina peruviana* Olsson from the Saman conglomerate, probably early upper Eocene.[3] With the Brachiopoda I found *Nummulites speciosa* W. Berry, originally described from the Saman conglomerate at Negritos, Peru, 50 miles south of Calita Sal, and several species of *Orthophragmina*, also originally described from the Saman conglomerate.

Nowhere else in the extremely thick series of Tertiary sediments found in northern Peru, so far as I know, are any brachiopods or *Orthophragmina* found. In the overlying beds are found many orbitoids, but these all belong to the large genus *Lepidocyclina* and its subgenera.

The new Brachiopoda may be described as follows:

Terebratulina peruviana W. Berry, n. sp.
Figs. 1–4

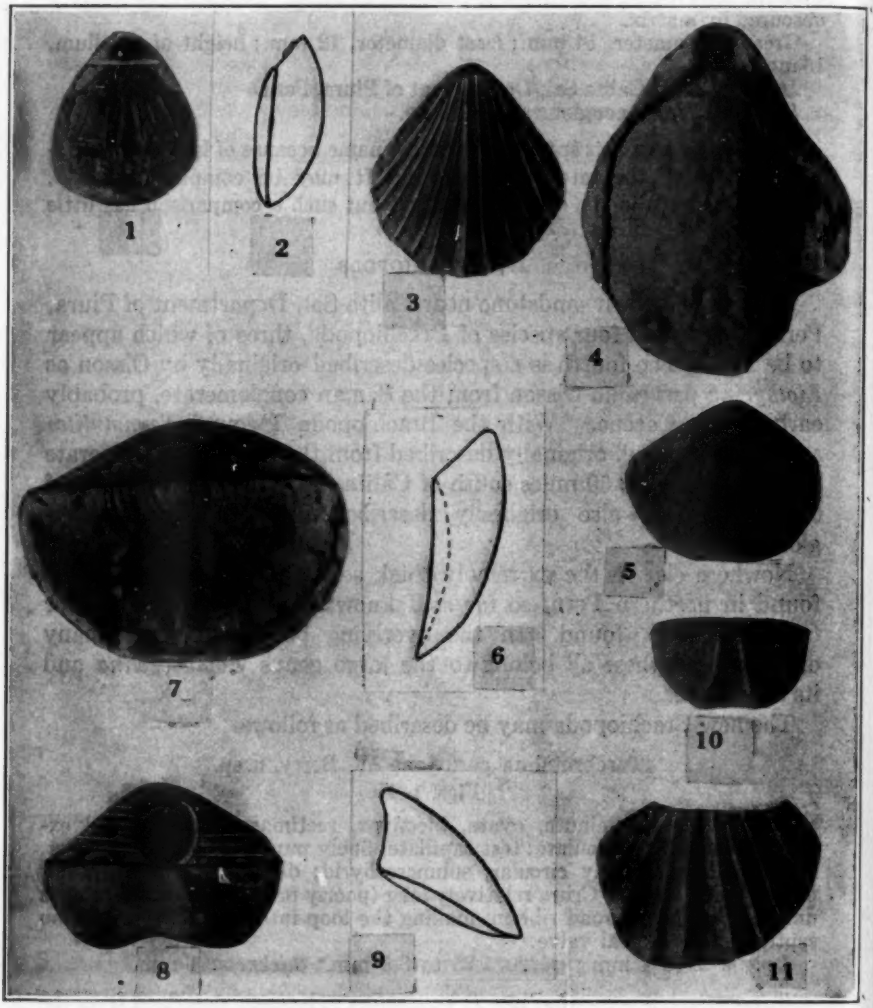
Shell extremely minute, ovate, biconvex, rectimarginate; cardinal extremities slightly auriculate; test capillate, finely punctate. Beak suberect. Foramen large, nearly circular, submesothyrid; deltidial plates disjunct; pedicle collar short. Crura relatively long (poorly preserved), crural process united by a fairly broad ribbon, making the loop into a ring. There is no septum in the dorsal valve.

Length: 1 to 4 mm.; *width:* 1.25 to 3.5 mm.; *thickness:* 1 mm.

T. peruviana is somewhat like *T. pectinoides* v. Koenen, described from the middle Oligocene of Germany,[4] but differs in the shape and size of the deltidial plates and in the relative abundance of the ribs. It is here given specific rank despite its small size, because if it were the young of a larger form there should certainly be found some of the adult specimens. The only larger brachiopod found in the formation belongs to another genus.

[3] A. A. Olsson. *Contributions to the Tertiary paleontology of northern Peru. Pt. 1. Eocene Mollusca and Brachiopoda.* Bull. Am. Paleont. **14** (52). 1928.

[4] Abh. Geol. Specialkarte Preussen **10** (6). 1894.



Figs. 1–4.—*Terebratulina peruviana* W. Berry, n. sp. Dorsal aspect; 2, profile; 3, ventral aspect; 4, dorsal aspect of a very large specimen.

Figs. 5–9.—*Argyrotheca peruviana* W. Berry, n. sp. 5, Ventral aspect; 6, profile; 7, dorsal aspect; 8, view of cardinal area; 9, profile of Fig. 8.

Figs. 10–11.—*Argyrotheca chica* W. Berry, n. sp. 10, Dorsal aspect; 11, ventral aspect.

All figures × 12½

Argyrotheca chica W. Berry, n. sp.
Figs. 10, 11

Shell minute, subrectangular to broadly oval; cardinal margin megathyrid; valves biconvex, nearly smooth, the median line of both valves being occupied by a sulcus on either side of which is one wide plication punctations rather fine, very noticeable; growth lines show faintly. Rostrum short, subtruncate. Foramen large, almost hypothyrid, incomplete; deltidial plates small, trigonal; pedicle collar well developed and supported by a heavy median septum which extends forward nearly to the middle of the valve. Crura widely separated, loop long (very poorly preserved).

Length: 2–3 mm.; *width:* 3–4 mm.; *thickness:* 1.5–2 mm.

This species differs from the following in having fewer plicae, more variable size of shell, and better development of the growth lines. I have concluded that it is a distinct species because no larger specimens of the same genus are found in the area.

Argyrotheca peruviana W. Berry, n. sp.
Figs. 5–9

Shell minute, subrectangular to transversely pentagonal; cardinal margin megathyrid; valves biconvex, multiplicate, the median line of both valves being occupied by a sulcus on either sides of which there are five rounded plicae, those of the ventral side being better developed then those of the dorsal side; punctations rather fine, very noticable. Rostrum short, subtruncate. Foramen very large, submesothyrid, incomplete; deltidial plates small, trigonal; pedicle collar well developed and supported by a median septum which extends nearly to or even a little beyond, the middle of the valve.

Length: 2 mm.; *width:* 3 mm.; *thickness:* 1.5 mm.

A. peruviana is somewhat like *A. beecheri* (Clark), described from beds at Vincentown, New Jersey, long assigned to the Cretaceous but recently placed in the Eocene. *A. peruviana* is smaller, has fewer plicae and much finer punctations than *A. beecheri.*

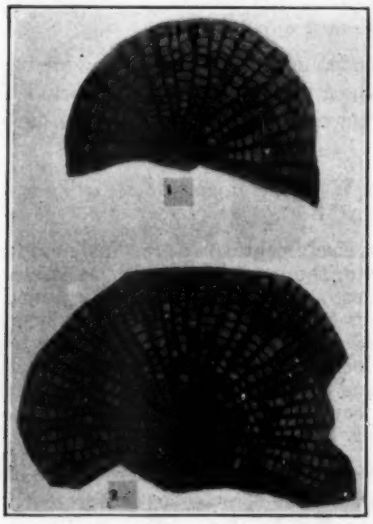
This is the first record of the genus in the Tertiary of South America and it is interesting to note that it is found most abundantly in the European Tertiary. There are about eleven species from North America and about thirty from Europe.

III, Foraminifer Gypsina

During some years work on the Tertiary section of northern Peru I found twelve specimens of a single species of *Gypsina.* The genus, originally a part of *Tinoporus* (Monfort?) Carpenter and later separated by Carter, contains about a dozen species rather widely scattered geographically. It is found in the present-day seas, usually in the shallow zones of both temperate and tropical areas and, according to Brady, seldom below 400 fathoms. Cushman[5] gives the range

[5] J. A. Cushman. *Foraminifera, their classification and economic use,* p. 330, 1928.

of *Gypsina* as Cretaceous to Recent. I have not been able, however, to find any record which carries it beyond the Tertiary. The species *G. globulus* (Reuss) has been described from the Miocene of Austria, Hungary, Malta, and Jamaica; from the Pliocene of Costa Rica; and the "Tertiary" of Palermo, Bordeaux, and San Domingo. The genus has been considered a chiefly Miocene group and hence it is of interest to describe a species from the Eocene. My material is from the gray-brown, gritty sandstone at a locality near Calita Sal, Department of Piura, Peru, and is associated with both large and small fossils typical of the Saman conglomerate.



Figs. 1, 2.—*Gypsina peruviana* W. Berry, n. sp. 1, Cross section of large specimen, × 35. 2, Cross section of small specimen, × 35.

The new species may be described as follows:

Gypsina peruviana W. Berry, n. sp.
(Figs. 1, 2)

Test small, spherical, apparently free; exterior reticulate surface-chambers opening directly to the outside; walls calcareous. Chambers arranged in radial columns, increasing in diameter from the center to the periphery. In the center the chambers are 19.5 microns in radial diameter and as much in cross section, with walls 8 microns thick; and they increase in size to 46 microns in radial diameter and 66 microns in cross section, with walls 15 microns thick, at the periphery of the averaged-size test. These radial columns of chambers each divide into two at about 156 microns from the center, at 234 microns, and again at 390 microns.

Diameter of test 0.9 to 1.67 mm.

G. peruviana may be compared to *G. globulus* (Reuss) in size and in general character of the surface. The interior features, however, are distinctive, particularly the bifurcation of the columns of chambers. In none of the described forms is such a feature mentioned. The division produces a greater number of chambers in a given circle than would be present if the columns did not divide but continued to increase in size enough to maintain the spherical form of the test.

PALEONTOLOGY.—*Notes on the ammonite genus* Karstenia *Hyatt.*[1] ERNEST C. H. ROSCHEN, Johns Hopkins University. (Communicated by JOHN B. REESIDE, JR.)

The genus *Karstenia* was proposed by Hyatt[2] in 1903 (as *Carstenia*) with *Ammonites lindigi* Karsten as genotype. In a revision of the old genus *Pulchellia*, Hyatt recognized two families, the *Heinziidae*, including the genus *Karstenia*, and the *Pulchelliidae*. The *Heinziidae* consisted of those forms in which the costae terminated at the venter in a single or double row of tubercles, elongated in the direction of coiling; and the *Pulchelliidae* included the highly compressed forms with a very narrow, or closed umbilicus. At that time Hyatt stated that the new genus, *Karstenia*, is characterized in the early stages of life by "coarse costae with double terminations becoming dichotomous at the middle lateral line and having a line of nodes at their junctions. These [nodes] are continued later on the single costae when these appear." The forms are stout, have a double row of outer tubercles close together on the ventral line, and the ventral furrow is narrow in young forms but later broadens and becomes similar to that of *Pulchellia* (= *Gerhardtia* Hyatt) *galeatoides* Karsten. In addition to the genotype, Hyatt included in *Karstenia* the species *Pulchellia caicedi* (Karsten), *P. subcaicedi* Sayn, *P. galeata* (D'Orbigny, not Von Buch), and *P. provincialis* Gerhart (=*Karstenia tuberculata* Hyatt).

Douville[3] did not accept Hyatt's division of the *Pulchelliidae* into two families, nor did he consider Hyatt's new genus *Karstenia* to be of more than sub-generic importance. In a revision of the genus *Pulchellia* in 1920 Gignoux[4] also did not accept the genus *Karstenia* and placed Hyatt's genotype, *Pulchellia lindigi* (Karsten), in a subdivision of the *Pulchellia*, the group of *Pulchellia* s. s. (tuberculées Gignoux), characterized by *P. provincialis* (D'Orbigny). In 1924 Collet[5] described a group of ammonites from the Barremian of Colombia in which are strongly emphasized the characteristic differences

[1] Received April 13, 1929.

[2] A. HYATT. *Pseudoceratites of the Cretaceous.* U. S. Geol. Surv. Mon. 44: 133–134. 1903.

[3] H. DOUVILLÉ. *Evolution et classification des Pulchellidés.* Bull. Soc. géol. France 11 (4): 285–320. 1911.

[4] W. KILLIAN, M. GIGNOUX, and others. *Contributions à l'étude des céphalopodes paleocrétacés du Sud-Est de la France.* Mém. Carte géol. France, pp. 135–166. Paris, 1920.

[5] L. W. COLLET. *Sur quelques ammonites du Barrémian de Colombie.* Ecologae. Geol. Helvetiae 18: 485–493. 1924.

in the growth of *Karstenia lindigi* (Karsten) as compared with representatives of true *Pulchellia*. He accepted Hyatt's genus *Karstenia* as valid.

This generic separation seems to be well founded, as the forms belonging to the genus *Karstenia* have stout whorls throughout their development and do not exhibit at any stage of growth the compressed whorls characteristic of the ontogeny of *Pulchellia*. As remarked by Collet, in the adult stages *Karstenia lindigi* (Karsten) converges toward *Pulchellia provincialis* and *P. galeatoides*.

During the examination of a collection of ammonites from Ubaté, Cundinamarca, Colombia, made by Dr. M. A. Rollot and presented by him to the U. S. National Museum, one well preserved specimen of *Karstenia lindigi* (Karsten) was found in which the ontogeny of the genus is admirably exhibited. The specimen presents an opportunity for a more thorough description than Collet gave, and since the validity of the genus has been doubted by most students of the *Pulchelliidae*, it has seemed worth while to record in detail the features exhibited by this specimen.

KARSTENIA LINDIGI (Karsten)

1856. *Ammonites lindigii* Karsten. Über die geognostischen Verhältnisse des westlichen Colombien, der heutigen Republiken Neu-Granada und Ecuador. Amt. Ber. Naturf. Gesell. Wien, 32te Vers., 1856: 108. *pl. 3, f. 3.*

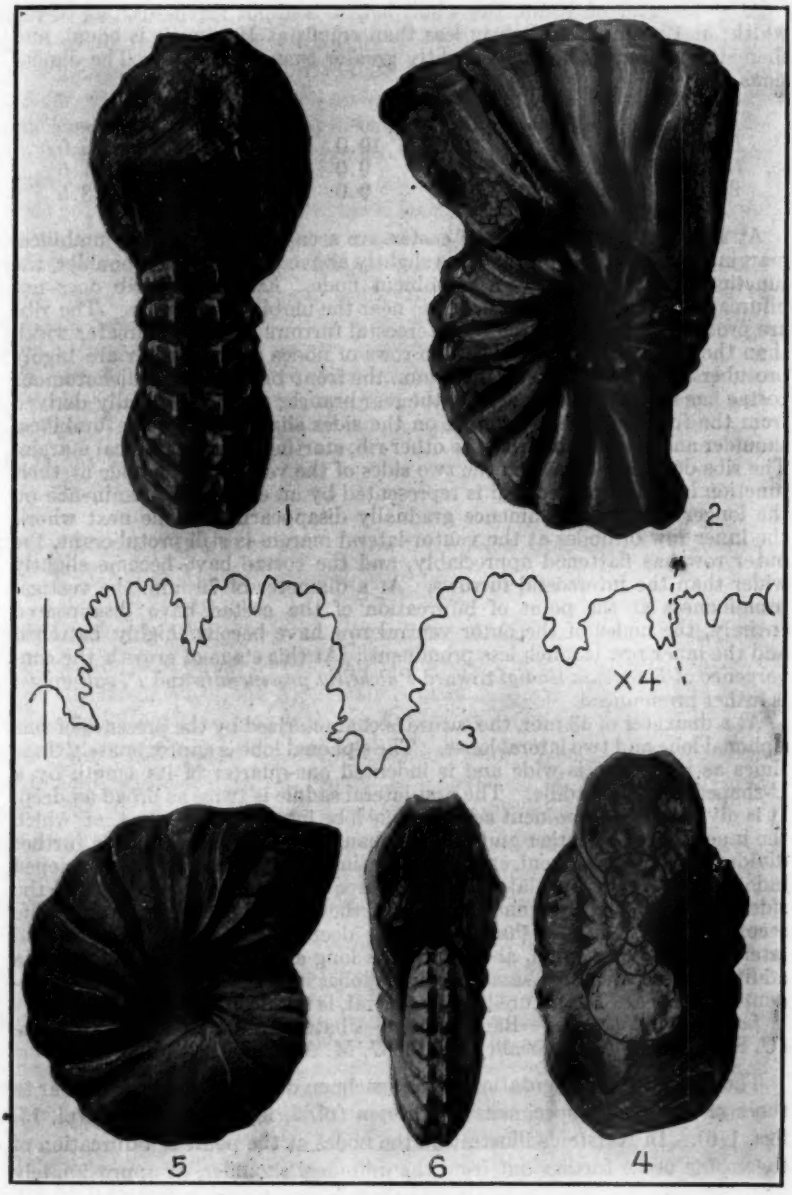
1883. *Pulchellia lindigi* (Karsten). V. Uhlig. Die Cephalopoden der Wernsdorfer Schichten. Denkschr. naturw. Classe. k. k. Akad. Wiss. **46**: 125. *pl. 20, f. 6.*

1886. *Ammonites lindigii* Karsten. H. Karsten. Géologie de l'ancienne Colombie Bolivarienne, Vénézuela, Nouvelle-Grenade et Ecuador. *Pl. 3, f. 3.* Berlin.

1903. *Carstenia lindigi* (Karsten). A. Hyatt. Pseudoceratities of the Cretaceous. U. S. Geol. Surv. Mon. **44**: 133–134.

1924. *Carstenia lindigi* (Karsten). L. W. Collet. Sur quelques ammonites du Barrémien de Colombie. Eclogae Geol. Helvetiae **18**: 488. *pl. 15, f. 1–6.* 1924.

Shell attaining a size of about 80 mm.; moderately involute; whorls stout and nephritic-subcircular in cross section; umbilicus wide and umbilical wall moderately steep, umbilical angle decreasing slightly in each successive whorl. Costae heavy and beginning at the umbilical margin, alternating with costae that arise on the sides slightly above the umbilical shoulder, the latter also rarely starting near the umbilical margin; both separated by deep intercostal furrows slightly narrower than the ribs; both possessing a double row of nodes on each side of the venter; lateral nodes flattened; ventral nodes prominent and elongated in the direction of coiling accompanied by rapid widening of the costae between the two rows of nodes; venter wide, ventral furrow channeling the costae and rarely the intercostal furrows also.



Figs. 1–4.—*Karstenia lindigi* (Karsten). U. S. N. M. cat. no. 73655
Figs. 5–6.—*Pulchellia galeata* (Von Buch). U. S. N. M. cat. no. 73656

At a diameter of 8 mm. the whorl height is about three-quarters of the width; at 12 mm. it is slightly less than equal; at 19 mm. it is equal, and thereafter gradually becomes slightly greater than the width. The dimensions are:

	mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
Diameter:	8.0	12.0	19.0	29.0	44.0	76.0
Height of whorl:	3.7	6.3	9.0	13.5	20.0	31.5
Width of whorl:	4.5	6.5	9.0	13.0	18.0	28.5

At a diameter of 19 mm. the costae are seen beginning at the umbilical margin, they bifurcate on the sides slightly above the umbilical shoulder, the junction being marked by a prominent node. Every third rib does not bifurcate and does not possess a node near the umbilical shoulder. The ribs are prominent and separated by intercostal furrows of slightly greater width than the ribs themselves. The two rows of nodes at the venter are highly protuberant. At a diameter of 41 mm. the front branch of the dichotomous costae has become independent of the rear branch; one rib, generally derived from the front branch, beginning on the sides slightly above the umbilical shoulder and alternating with the other rib, starting at the umbilical margin. The ribs do not alternate on the two sides of the venter. The node at their junction has disappeared and is represented by an elongated prominence on the longer rib, this prominence gradually disappearing on the next whorl; the inner row of nodes at the ventor-lateral margin is still protuberant, the outer row has flattened appreciably, and the costae have become slightly wider than the intercostal furrows. At a diameter of 79 mm. the vestigal prominences at the point of bifurcation of the costae have disappeared entirely, the nodes of the outer ventral row have become highly flattened and the inner row is much less prominent. At this stage of growth the convergence of *Karstenia lindigi* toward *Pulchellia provincialis* and *P. galeatoides* is rather pronounced.

At a diameter of 43 mm. the suture is characterized by the presence of one siphonal lobe and two lateral lobes. The siphonal lobe is approximately three times as long as it is wide and is indented one-quarter of its length by a U-shaped siphonal saddle. The first lateral saddle is twice as broad as deep. It is divided by a prominent adventitious lobe into unequal halves, of which the inner is slightly larger and broader than the outer. Each half is further divided by one prominent small indentation, and several feebly developed indentations. The first lateral lobe is three times as long as wide, and the sides converge slightly from the base of the lobe to the blunt apex. The second lateral saddle is shallow, a little deeper than broad. The second lateral lobe is very small, about twice as long as wide and trifurcated. In addition there are three small auxiliary lobes and saddles with slightly indented outlines. The suture line, in general, is not deeply dissected.

Locality and horizon.—Barremian at Ubaté, Cundinamarca, Colombia. (U. S. N. M. Mesozoic locality no. 10537, M. A. Rollot collection.)

The form and ornamentation of the specimen described are very similar to those of the figured specimens of Karsten (pl. 3, fig. 3) and Collet (pl. 15, figs. 1–6). In Karsten's illustration the nodes at the point of bifurcation of the costae occur further out from the umbilical shoulder, at approximately

the middle lateral line. Karsten's illustration of *Ammonites caicedi* (pl. 3, fig. 2) would indicate that this species is closely related to *Karstenia lindigi*. It has a higher degree of involution than *Karstenia lindigi*, the ventral channel is wider, the outer row of ventral nodes is less pronounced in specimens of the same size, the nodes at the point of bifurcation of the costae are closer to the umbilicus, the costae are heavier and broader, and the whorl section is more compressed near the venter.

As previously remarked, the adult forms of *Karsenia lindigi* have the general appearance of *Pulchellia provincialis* and *P. galeatoides*. However, in these two species of the *Pulchellia* the ontogeny is characterized by the development at some stage of compressed whorls that become gradually stouter, whereas *Karstenia lindigi* is characterized by stout whorls that become slightly compressed in the mature individuals.

The morphological features of the specimes of *Karstenia lindigi* examined by the writer, as well as other specimens referred to the genus *Karstenia* by other writers, do not justify the alienation of Hyatt's family *Heinziidae* from the family of the *Pulchelliidae*.

BOTANY.—*A singular new* Dryopteris *from Colombia.*[1] WILLIAM R. MAXON, U. S. National Museum.

In the course of recent work upon South American ferns, the curious Colombian plant (*André* 3497) here discussed was met with in material from the herbaria of the Field Museum of Natural History, the New York Botanical Garden, and the Royal Botanic Gardens, Kew. It had been distributed as *Aspidium munitum* Kaulf. [*Polystichum munitum* (Kaulf.) Presl, a Pacific coast species of temperate North America], an identification suggested presumably by the polystichoid form of the pinnae; but it belongs to the genus *Dryopteris* and is nearly related only to a Colombian species, *D. longicaulis* (Baker) C. Chr., previously described and figured. It may be known as

Dryopteris cornuta Maxon, sp. nov.

Rhizome epigeous, slender and greatly elongate (15 cm. long in incomplete material at hand), rampant or rigidly ascending, woody, 6–8 mm. thick, deeply sulcate, light brown, lustrous beneath a dense covering of short spreading griseous hairs, obliquely paleaceous, the scales loosely imbricate, 5–6 mm. long, subulate from a subcucullate thickened lance-triangular base (here 1 mm. broad), broadly attached, bright brown, firm, rigidly griseous-puberulous on the surfaces, similarly ciliate. Fronds few, alternate, rigidly

[1] Published by permission of the Secretary of the Smithsonian Institution. Received April 10, 1929.

Fig. 1.—*Dryopteris cornuta* Maxon. Two-fifths natural size

ascending, 60–65 cm. long; stipes 10–15 cm. long, 1.5–2 mm. thick, brown, lustrous, very obliquely attached, appearing long-decurrent upon the rhizome, griseous-puberulous, bearing a few scattering scales; blades nearly linear, 50–55 cm. long, abruptly acuminate-caudate at apex, simply pinnate, 6–7 cm. broad in the basal third, slightly narrowed at the rounded or abruptly acutish base, only the basal pair of pinnae reduced (1.5–2 cm. long), occasionally subhastate; vestigial pinnae wanting; rachis similar to stipe, stoutish; pinnae very numerous (about 52 pairs below the inciso-lobate apex), those of the basal fourth opposite or subopposite, the others alternate, all distant, spreading, upwardly falcate, linear, obtuse or acutish at tip, strongly inequilateral at base, narrowly convex-cuneate below, deltoid-auriculate above, entire, sessile, provided with a prominent dark indurate mammiform aerophore; largest pinnae 3.5 cm. long, 6.5 mm. broad at middle; midribs stout, elevated above, slightly so beneath, griseous-strigillose, as also the whole upper leaf surface, the under side sparingly so; veins about 25 pairs in the largest pinnae, very oblique, for the most part closely once-forked, each branch fertile about midway to the margin, the sori thus appearing paired; vein of basal auricle with 3–6 pairs of pinnately arranged branches, these similarly fertile; sori small; indusia minute, brown, setulose, shriveling but persistent; sporangia few, glabrous. Leaf tissue firm-herbaceous, dull brown, eglandulose.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected near Altaquer, Colombia, May 23, 1876, by E. André (no. 3497). This is the best of the three specimens above mentioned, and is the only one showing the rhizome.

Allied closely to *Dryopteris longicaulis* (Baker) C. Chr., the original collection of which (*Kalbreyer* 1454) is known to me from Baker's illustration[2] and from fragments of the type kindly forwarded from Kew. Kalbreyer's specimen, from Antioquia, is the only one cited by Christensen in his Monograph; but there is now at hand a second specimen, this collected at "La Gallera," Micay Valley, Department of El Cauca, Colombia, at 2,000–2,200 meters, July 1, 1922, by E. P. Killip (no. 7950), which matches the type perfectly. The species is evidently very rare.

Dryopteris longicaulis differs materially from *D. cornuta* in its several pairs of remote, greatly reduced basal pinnae, its fewer and regularly lobed major pinnae, its nearly glabrous under surface, its numerous veinlets, and its subglabrous indusia, as well as in other less obvious characters.

BOTANY.—*Shall the International Botanical Rules have the import of law?*[1]

J. FRANCIS MACBRIDE, Field Museum of Natural History. (Communicated by PAUL C. STANDLEY.)

In the recent appearance of three scholarly papers dealing with the taxonomy of entirely unrelated plants, a contrast in interpretation of

[2] Hook. Icon. Pl. 17: *pl. 1658*. 1886.

[1] Received April 15, 1929.

and respect for the International Rules of Botanical Nomenclature is presented that seems worth commenting upon, especially since it emanates from four well-known botanists whose attitude toward these Rules, which they purport to follow, is of particular interest in view of the impending International Congress.

One paper considers the case of *Ophiopogon* and *Liriope*,[2] another Schmidel's publication of *Thelypteris*,[3] and the third describes a new species of *Muhlenbeckia*[4] and gives "the correct combination for an old species."

The case of *Ophiopogon* is met decisively: the name *Mondo* is shown to antedate *Ophiopogon* and to have been validly published; accordingly the author concludes, since "the generic name is not rejected by the International Rules * * * its restoration is inescapable." The fact that the plants are of increasing importance in horticulture, though the author himself is a great horticulturist, has not influenced his decision. His paper, in every sense, is an example of legal publication.

Similar in intent is the article concerning the publication of *Thelypteris*, which the authors regard as properly published "by the statements of the International Rules." Accordingly they use the name in preference to *Dryopteris* but admit that "to have to resuscitate it, with the ultimate necessity of scores or hundreds of new combinations, is undoubtedly a misfortune; but is no greater misfortune than was the exhumation of the equally disused *Dryopteris*, from the 'dust of synonyms,' with the resultant 500 new combinations of the Index Filicum alone." This seems to be specious reasoning—to show that this case is not similar to that of *Ophiopogon* it will be argued briefly—inasmuch as the 500 new combinations have already been made and therefore the continued use of *Dryopteris*, if it can be done legally, would avoid the addition of them to synonomy and the coining of 500 more names, all (at least theoretically) potential synonyms! In this instance it would seem that the authors, working under what has been aptly termed "the spirit of the International Rules," might have been content with their statement of the respective merits of the case for and against *Thelypteris* (according to their interpretation of the Rules), deferring new publication, since disagreement of authorities as to its validity is well known. Incidentally it may be remarked that its

[2] Gentes Herbarum **2**: 1–37. 1929.
[3] Rhodora **31**: 21–27. 1929.
[4] Contrib. Gray Herb. **81**: 67–86. 1928.

acceptance by Drs. Nieuwland and Slosson, who work under another code, is surprisingly cited as a determining factor in the authors' own acceptance! At any rate, the case of *Thelypteris* and *Dryopteris* is an outstanding example of a nomenclatorial problem not clearly to be settled without resort to conservation. Many names have been conserved with less reason or in less "justice."

How different is the situation in regard to *Mondo* (*Ophiopogon*). *Mondo* is shown indubitably to have been published validly, and so the author "takes it up," no doubt expecting that other workers under the International Rules will adopt it as he has, legally and in good faith, unless it can be shown that through error or misinterpretation his action actually does not conform to the rules followed. Possibly, or at least practically, it may have been his privilege to postpone publication under the legal name *Mondo* until a Congress could conserve *Ophiopogon*, but evidently, as a matter of course, he reached his own decision, based on the definite pronouncements of previous Congresses. A few botanists[5] think that it should definitely be made legal to leave such matters, at the discretion of the individual, to the action of a succeeding Congress. A special ruling on this, however, scarcely appears to be necessary, since the legality of names such as *Layia* versus *Blepharipappus* and *Thelypteris* versus *Dryopteris*, which can be settled only by special law anyway, will automatically be decided eventually, and those working in the spirit of the International Rules will naturally defer publication involving *questionable* name-changes until a Congress acts. Others will not do so in any event; but unless their case is clearly within the law it will have no permanent standing. The ruling proposed, applicable to the status of a validly published name like *Mondo*, would, therefore, only weaken the Rules and serve as an entering wedge of disapproval for individuals with some personal dislike for accepting a given name, even though taken up legally.

But the third author—to return to the consideration of the legal status of the three matters referred to at the beginning of this paper—has lapsed in his long-evident desire, as shown by his other (and meritorious) publications, to follow the International Rules. He publishes a new species under the name *Muhlenbeckia* and makes a new combination (with this name) which he even calls "correct,"[5] although cognizant of the recent restoration of an earlier and valid generic name. Can such disregard for the International Rules be justified?

[5] Candollea 2: 515–519. 1926.

It violates Articles 15 and 50. It substitutes individual preference for law. It is even contrary to the spirit of the International Rules, for no explanation is vouchsafed of the modification to suit personal fancy. The author thus cloaks his violation with the apparent excuse of ignorance. The consequences of such independent action by individuals purporting to work under the International Rules may become serious. As one botanist recently inquires pertinently, "and supposing that the desired alterations in the Rules are eventually made, do they expect their fellow botanists to accept them, when they themselves have set the example of departing from the present Rules?" The botanical congress at which the Rules were drawn up with wisdom added finally Article 58.

The case of *Ophiopogon* and the case of *Muhlenbeckia* are exactly parallel examples involving nomenclatorial changes in accord with law. The author who considers the first also deals with the second, and necessarily rejects *Muhlenbeckia* as he rejects *Ophiopogon*. Is his work invalidated because someone has (or may have) suggested that one or both names be conserved? At what particular date from Congress to Congress do such suggestions have the force of law? Is a legal name-change illegal because it happens to be made two or three years before a Congress meets, or just what *is* the term of the blank period for the functioning of International Botanical law? Perhaps the *nomina conservanda* likewise are no longer conserved during this time, and verily one should publish warily. (The situation could become even more complex.) And finally, do the International Rules cease to operate when the plants considered are cultivated, and, if so, grown to what extent? In the case of *Muhlenbeckia* at least, any anxiety felt for one species often cultivated has been dispelled by the creation, with good reason, of a separate genus for it—so it has to be known by another name, after all. Or perhaps one should not let scientific considerations change the name of any cultivated plant—a "distressing" necessity to some, apparently, to be thwarted at all odds.

But the merit of taking up the earlier and valid names for *Ophiopogon* and *Muhlenbeckia* is, after all, of incidental interest; the important fact remains that, as these names have been restored legally, other botanists, even if they feel the restoration ill-advised, may be expected to support it. If compliance with the law, where the working of the law is perfectly clear as in these cases, cannot be taken for granted, one may well ask if the Rules are more than a scrap of paper. "What useful purpose is served by departure from the Rules,?" the botanist

quoted above has inquired. "If the intention is to bring about their amendment, would not a detailed statement of the case be equally effective?"[6]

The rather amazing theory has been advanced by some in recent years that botanical law is not to be modified or extended. Rather it it is of paramount importance that it shall not be changed by the individual as a law unto himself. And if the Rules are to be regarded with increasing respect, any alteration ought to be made only by a representative group of taxonomists chosen for the purpose and not by a heterogeneous crowd of "botanists" many of whom, as members of distantly related and highly restricted fields, naturally enough can have no proper understanding of the taxonomic problems involved, perhaps quite unaware that permanent stability in nomenclature can never result from ill-considered arbitrary action. This, perhaps, is an unreasonable hope if one is to judge from the names signed to a recently distributed protocol proposing emendation of the Rules. One may well wonder how much experience and knowledge was back of the majority voting there recorded! There are many "border-line cases" subject to different interpretations, and the responsibility for their settlement necessarily rests upon such a Congress or its committee. To mention only a few names besides *Thelypteris* and *Dryopteris*, there are *Gerardia* and *Stenandrium*, *Allocarya* and *Maccoya*, *Parosela* and *Dalea*, and perhaps, in the minds of some, *Nymphozanthus* and *Nuphar*. None of these cases is exactly similar to another. *Parosela* has technical standing and the necessary name-changes have been made, but to some its standing is not clear. *Allocarya* has no legal standing, but no transfers to *Maccoya* have been made, so the acceptance of the latter by any botanist, this being legal, would make it a case equivalent to those of *Ophiopogon* and *Muhlenbeckia*, and to conserve it arbitrarily after the transfers have been made would serve no useful purpose and be analogous to locking the door after the horse has been stolen. *Nymphozanthus*, apparently, is valid and it is highly to the credit of the author who restored it, according to law, that he had the courage of his convictions. He did not evade the law and thereby create disrespect for it. This case is an excellent example of an unfortunate name restored by the working of established law. It is very question-

[6] Certain provisions, probably transitory and mostly minor, that in the name of good taste or judgment are regularly ignored or violated, even as in civic law, will scarcely be cited by any but a narrow mind in trying to refute the correctness of my general premise.

able, however, if any subsequent Congress should interfere in this or any other case in which the law has been clearly observed, certainly rarely. Even if modern botanical law is in the process of formulation, surely we cannot at will strike out the very fundamentals of it, when a name or an action in which it results displeases us, and still have any firm foundation upon which to build. Otherwise we may well ask ourselves if it is our intent to stifle or to stimulate individual effort. We shall accomplish only the former if a few, powerful by connection and connection's tradition, can violate adopted law and have their action accepted. Simply because there are troublesome and "unfortunate" cases, often involving large genera, is disrespect for the International Rules to be encouraged by unnecessary conservation, thus condoning disobedience to the law when the law has clearly sanctioned, if not demanded, generic and specific changes? Shall, for example, *Celmisia* be conserved for *Elcismia* because known in cultivation or for any other reason, though dozens of new names have already been made in good faith legally? "The name has not been mentioned in the lists of *nomina conservanda* or *nomina rejicienda* so it (*Celmisia*) must take its course under the rules of priority," wrote this sincere and careful follower of the Rules in 1913. So, likewise, shall *Berlinia* be permitted to supplant the earlier *Westia*, the restoration having been made, or *Bassia—Madhuca; Ophiopogon—Mondo;* or *Muhlenbeckia—Calacinum?* (Many examples could be found that would be associated with most of the active taxonomists of the world).

Of course, the answer most emphatically for every seeker of stability in nomenclature and for every sincere supporter of the International Rules is "No!" Let the coming Congress, then, concern itself rather with the many moot questions that truly require congressional consideration, and take extra-legal action in settling them only after most cautious and careful analysis of all contributing factors, so that respect for already established law may not be further endangered.

PALEOBOTANY.—*A palm nut of* Attalea *from the upper Eocene of Florida.*[1] EDWARD W. BERRY, Johns Hopkins University.

The specimen to be described comes from the Ocala limestone, which is a soft, white to yellowish, porous limestone underlying considerable areas in western and peninsular Florida. It was long thought to be of

[1] Received April 13, 1929.

Oligocene age but Cooke[2] showed in 1915 that it was beneath the Vicksburg in western Florida, and that it was represented beneath the Vicksburg in Alabama and Mississippi by the upper part of the Jackson of those two states. The history of the term Ocala and its interpretation is given in some detail in the paper cited.

The Ocala is a typical shallow, clear-water, marine deposit, carrying a large fauna which includes *Basilosaurus* (*Zeuglodon*) and numerous orbitoid foraminifera. So far as I know no fossil plants have been recorded in the Ocala, as might be expected from its character, although it doubtless contains some drift wood to which no one has paid any attention. Recently Mr. Herman Gunter, State Geologist of Florida, sent me the calcified palm nut which forms the subject of the the present note. This nut was picked up on the eroded surface of the Ocala limestone, and both its identity and the character of its preservation indicates that it undoubtedly was weathered from that formation. The exact locality is 2½ miles northeast of Williston, Levy County, on the property of the Florida Shell Rock Company.

The specimen proves to be a new species of an existing tropical American genus of palms, hitherto unknown as a fossil, and of considerable interest for a variety of reasons. Since only the type specimen is known this has not been sacrificed in an endeavor to ascertain what, if any, of the internal structure has been preserved. It may be incompletely described from its external features as follows:

Attalea gunteri Berry, n. sp.
Figs. 1, 2

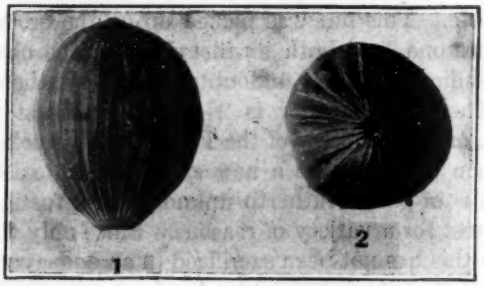
Nut sub-sperhical or slightly turbinate, broadly rounded above with a faint apical pole, narrowing slightly below the middle to the truncated base. Sub-symmetrical in form. Nearly circular in transverse profile and evidently borne with others in a loose cluster in life. Peduncle scar large and central. Substance consisting of longitudinal fibres, of which some are larger and more higly sclerotized than the ground mass. Length 3.2 centimeters. Diameter about 2.5 centimeters.

It would, of course, be highly desirable to confirm the external resemblance of the fossil to the modern fruits of *Attalea* by some information as to the number of contained seeds, but this is impossible without sacrificing the specimen. The only genus which I regard as possibly liable to confusion with *Attalea* is the genus *Elaeis* of Jacquin, a small genus ranging in the modern flora from Costa Rica to the Amazon

[2] C. W. Cooke. *The age of the Ocala limestone.* U. S. Geol. Survey Prof. Paper 95: 107–117. 1915.

and equatorial west Africa. In *Elaeis* the largest fruits are considerably smaller than the fossil.

The existing species of *Attalea* number between 25 and 30, and range from Central America and the Antilles to the Amazon Basin, and along the eastern Andes to Bolivia. Its fruits are readily transported for short distances by ocean currents, although it is not especially a coastal type, and it might readily have been introduced into southeastern North America during the upper Eocene by that means. That the genus was actually a member of the upper Eocene flora of Florida, and that the fossil does not represent a stray drift-fruit from elsewhere which was stranded on the Florida coast I regard as highly probable.



Figs. 1, 2.—Side and proximal views of *Attalea gunteri* Berry, n. sp., natural size, from the Ocala limestone of Florida.

This is indicated by the perfect condition of the fossil, which shows no signs of abrasion, maceration, incrustation or attacks of marine organisms, and also by the fact that the upper Eocene floras of southeastern North America[3] are the most tropical that are known from this area.

One feature of interest in connection with the finding of a fruit of *Attalea* in the marine Ocala is the abundance of palm remains in the more littoral deposits of Jackson age in Georgia, Tennessee, Kentucky, Louisiana and Texas. The genera *Phoenicites, Thrinax, Sabalites, Nipadites, Palmocarpon,* and *Palmoxylon* have been recognized in beds of this age in the states mentioned. The last mentioned genus, *Palmoxylon,* is a form genus based on petrified palm wood. Two species of *Palmoxylon* have been described from the Jackson and more are probably represented, silicified palm wood being so abundant in

[3] See the account of the Jackson flora in EDWARD W. BERRY, U. S. Geol. Survey Prof. Paper 92. 1924.

the upper Jackson of Louisiana that the Indians used it as a source of material for their stone implements.[4]

Although no fossil species of *Attalea* have hitherto been recorded, the genus was in existence at this time, as is attested by quantities of fruits of a species of *Attalea* which I have from the late middle Eocene of northwestern Peru. The native genera of palms in the modern flora of Florida are *Thrinax*, *Coccothrinax*, *Sabal*, *Serenoa*, *Roystonea*, and *Pseudophoenix*, all of which have small drupaceous or berry-like fruits, entirely unlike the fossil form.

The present species should be readily recognized if encountered by future collectors, a contingency much to be hoped for, since it will enable sections to be cut, and thus verify or disprove the present identification based upon the external features.

ZOOLOGY.—*The ambulatory tubes and other features of the nema* Draconema cephalatum.[1] N. A. Cobb, U. S. Department of Agriculture.

There is no adequate published description of the locomotion of *Draconema* and its numerous marine relatives; very few persons have ever witnessed one of these nemas perambulating its natural substratum.

Draconema moves much after the manner of the ordinary inchworm, or measuring worm. The caterpillar called the "inchworm" has two bunches of feet, a bunch near each extremity. Standing on the bunch of hind feet, it stretches forward and takes hold with the front bunch. Then, releasing the hind bunch, it draws the body forward into a loop so that the posterior bunch may attach itself near the front one. Loosening the front bunch, the caterpillar again stretches forward, etc.

It is convenient to speak of the two attachment organs of the adult *Draconema* as "soles." The method of attachment of these soles to the substratum in *Draconema* is very different from that of the inchworm. The sole of *Draconema* is armed with projecting hollow setae connected with internal glands supplying a sticky and, presumably, non-water-soluble secretion, and it is by the aid of this secretion emerging from ends of the hollow setae that the sole is attached.

[4] Edward W. Berry. Pan-Amer. Geol., **45**: 273–276. 1926.

[1] Received May 2, 1929.

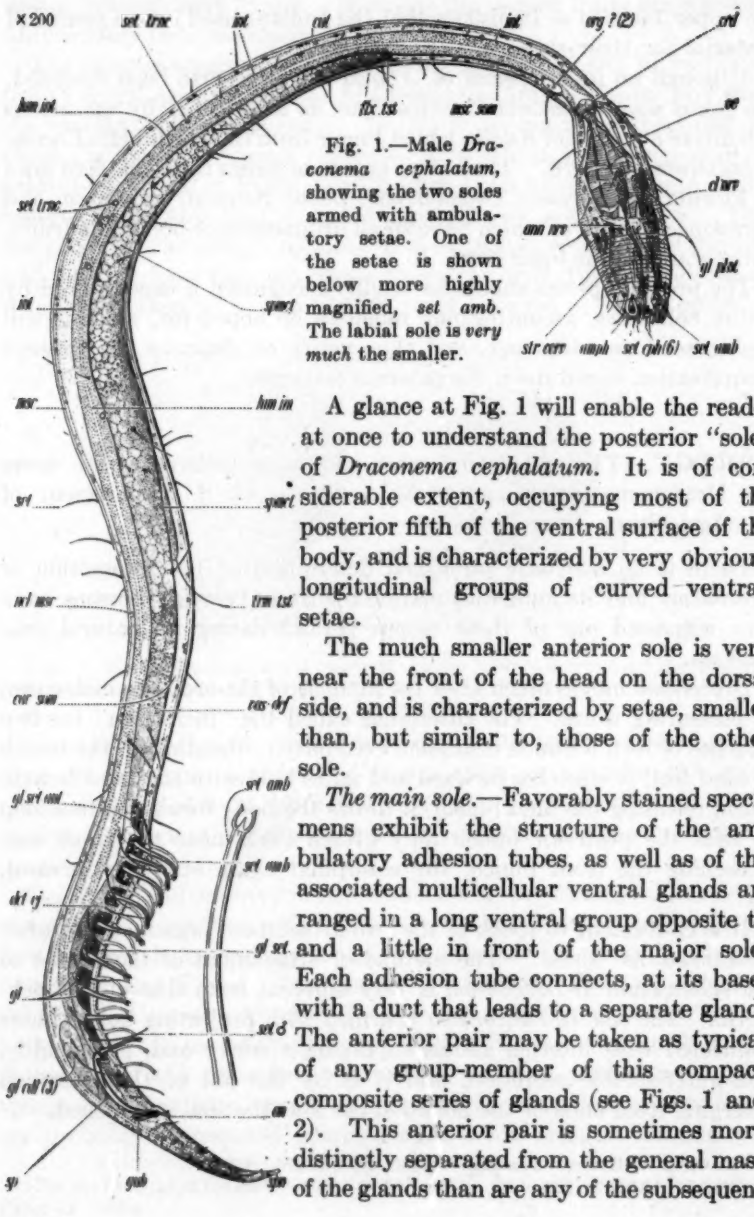


Fig. 1.—Male *Draconema cephalatum*, showing the two soles armed with ambulatory setae. One of the setae is shown below more highly magnified, *set amb*. The labial sole is *very much* the smaller.

A glance at Fig. 1 will enable the reader at once to understand the posterior "sole" of *Draconema cephalatum*. It is of considerable extent, occupying most of the posterior fifth of the ventral surface of the body, and is characterized by very obvious, longitudinal groups of curved ventrad setae.

The much smaller anterior sole is very near the front of the head on the dorsal side, and is characterized by setae, smaller than, but similar to, those of the other sole.

The main sole.—Favorably stained specimens exhibit the structure of the ambulatory adhesion tubes, as well as of the associated multicellular ventral glands arranged in a long ventral group opposite to and a little in front of the major sole. Each adhesion tube connects, at its base, with a duct that leads to a separate gland. The anterior pair may be taken as typical of any group-member of this compact composite series of glands (see Figs. 1 and 2). This anterior pair is sometimes more distinctly separated from the general mass of the glands than are any of the subsequent

pairs or groups; and each of these two glands proves to have three nuclei. (See Fig. 2.) The cells of each gland, as well as their spheroidal nuclei, increase in size from front to back, the anterior, i.e., distal, cell having less than one-eighth the volume of the posterior; the nucleus in the small anterior cell is also less conspicuous. This group (pair) of glands is more or less clavate in form and is nearly as long as the corresponding body diameter. Posteriorly, each gland diminishes suddenly in diameter to form a duct about half as wide as one of the adjacent annules of the cuticle. Near the gland the wall of the duct contains somewhat elongated nuclei of considerably smaller size than the nuclei of the glands. The duct also lacks the granular character of the glandular cells themselves. The two ducts, at first ventral, diverge backward to the two foremost adhesion tubes, and are one to two times as long as the glands. Near where a duct enters the somewhat swollen base of an adhesion tube, there is a small duplex enlargement or ampulla. In the specimens under examination, only in the very basal portion of the adhesion tube is there any indication of the staining action of the acid carmine.

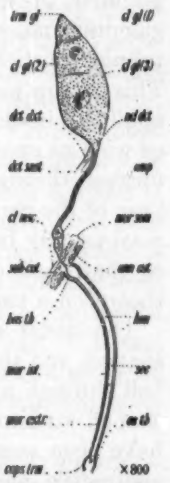


Fig. 2.—Anterior ambulatory seta of *D. cephalatum* with its 3-celled gland, its 3-celled mate concealed, though part of its duct shows,—*dct snst.*; *som*, body wall; *cl msc*, somatic muscle; *an cut*, cuticular annules; *mur ext* and *mur int*, outer and inner walls of ambulatory tube; *os tb*, secretory pore.

The numerous glands composing this ventral series are so closely packed together that, as a rule, it is difficult to distinguish the exact number of groups, but it is evident that throughout the series the glands are arranged in groups side by side, apparently mostly in pairs or quartets, the number of glands being commensurate with the number of adhesion tubes. On occasions when the entire group of glands is slightly separated from the body wall, and therefore from the bases of the adhesion tubes, the ducts leading to the tubes are distinctly visible, and have the appearance, when viewed laterally, of a rather complicated plexus.

The minor, or cephalic, sole.—The dozen or so adhesion tubes and glands of the cephalic sole have the same general plan as the sublateral and subventral ones of the posterior sole just described. The glands connected with the cephalic tubes (*gl. plnt*) are located mainly dorsad in the anterior two-fifths of the neck between the oesophagus and the body-wall; there are two dorsally

sublateral groups of glandular cells and four subdorsal groups, corresponding to a similar grouping of the six pairs of adhesion tubes. The glands of the cephalic sole are sometimes rather more strongly stained than those of the posterior sole in the same specimen, but present the same general anatomical and histological structure. Referring to the dorsally sublateral cervical glands as examples (see Fig. 1), these are distinctly granular in structure and apparently duplex, that is, have a well marked constriction near the middle, on opposite sides of which, fore and aft, is a considerable volume of nuclear (?) matter; the remaining portion of the cells is rather coarsely granular, the granules measuring nearly 1μ in diameter. This duplex glandular mass is half as long as the neck and anteriorly tapers to a tubular portion not much wider than one of the cervical annules. This narrow portion of the gland in turn tapers to a very narrow duct about 2μ in diameter, which swells to form a fusiform duplex ampulla as wide as one of the coarser cervical annules. The ampulla empties forward through a short narrow duct, 1 to 2 μ wide, directly into the base of the corresponding adhesion tube, where a little stained matter may usually be seen. The adhesion tubes reach exactly to the lips, so that their outpour is practically terminal. All these details are shown on a small scale in Fig. 1.

The distal extremity of the ambulatory tube is somewhat bell-shaped, and the lumen of the tube is prolonged into the cavity of the bell through a short conoid extension. The significance of this bell-shaped structure remains more or less problematical. No elements have been seen in the tube, or in the bell, that could be regarded as contractile, and one therefore seems obliged to assume that whatever changes of form are exhibited by this bell-shaped structure are due to such factors as its own elasticity, the pressure of the internal secretion and counter pressure of the external water. It would seem advantageous to the nema if the secretion which flows out through the bell-shaped organ could be "cut off" at will, and it is conceivable that this bell-shaped affair in some way accomplishes that end. Again, it is conceivable that the bell may mechanically give to the end of the tube a greater adhesiveness, conceivably through suction,—a suction that might be made to vary with the relationship of the distal end of the tube to the substratum, as in the familiar elastic concave rubber suction disc.

The facts that the setae of the inner rows are always the shorter, and that all the setae are incurved, suggest that a suitable substratum may be a microscopic filament, or a thin edge of something. This

thought arises from the fact that the main sole appears "bow-legged," as it were. Such apparently suitable thin and narrow forms of substratum occur on certain marine algae and, as a matter of fact, at least two observers—Cobb and Chambers—have seen *Draconema* perambulating the surface of algae.

In balsam specimens from Hudson Bay the body-wall tissues surrounding the mouth-opening have a golden yellow color and take on the form of a six-parted, but twelve-pointed, star.

Probably the excretory pore is at the lips. I formerly referred to a cell just behind the cardia as possibly representing the renette; this suggestion may not be well founded. In this region I observe two of these cells lying side by side in subventral position (see Fig. 1), separated by a small space. In the same latitude, just behind the minute cardiac cavity, on each side of the intestine, there is a rather compact group of granular cells containing about a dozen nuclei. These groups are as long as the corresponding body diameter, and about half as wide as long. Between the two groups, on the dorsal side, there is a pair of subdorsal granular cells rather closely resembling the subventral ones just described. As to the function of these lateral groups of cells, it seems not impossible,—as they are free at their posterior ends and seem connected with the intestine anteriorly,—that they may be special glands associated with digestion. There is a similar pair of lateral groups of cells in front of the cardia, emptying (?) backward. I do not think the possibility is excluded that some of these cells are nerve cells.

The intestine is composed of cells of such a size that about six are required to complete a circumference. The thin refractive lining is hardly 1 μ thick. The cardia, as usual, presents a distinct group of closely packed nuclei, indicating that it is composed of cells of rather small size, of which the number is probably about fifteen to twenty. Notable is the presence of *scattered cells in the wall of the intestine which stain differently* from their neighbors. These, no doubt, discharge some special function. Thus far they have been observed only in the anterior portion of the intestine.

The portion of the neck opposite, and adjacent to, the oesophageal constriction, except such portion as is occupied by the glands of the minor sole, is rather closely packed with nerve cells.

The lateral fields are one-third as wide as the body and contain a considerable number of nuclei rather irregularly arranged.

The cuticle in the posterior region of the tail is traversed by radial elements that give rise to a finely punctate appearance on the surface (see Fig. 1).

An interesting observation is the apparent connection of the tandem group of three caudal glands with the dorsal field by means of a narrow strand running forward, possibly of a nervous character, as is suggested: 1, by its form and position; 2, by its size and structure.

The internal extremity of the gubernaculum lies near the body axis and is connected fore and aft with the ventral body-wall by slender strands of muscular tissue. The testis is now believed to be reflexed, not outstretched as formerly figured.

The broad, rapidly tapering ovaries,—the anterior lying to the right, the posterior to the left,—are reflexed to nearly opposite the vulva and contain comparatively few ova, arranged in single file in the wider part, elsewhere irregularly. Hundreds of subspherical sperm cells may occur in the uterus. Usually there is one egg at a time in the uterus, thin shelled and smooth, and deposited before segmentation begins. The eggs are three-fourths as wide as long and about two-thirds as long as the corresponding body diameter.

Some of the results of the present investigation have been more or less definitely forecast by various observers on several occasions, notably by Steiner and Irwin-Smith, both of whom from inadequate material, have, with admirable insight, suggested the probable connection of the adhesion tubes with internal structures and also the possibility of the glandular nature of these latter.

While no doubt now remains that both the major and minor soles are glandular and are organs of locomotion, it still seems to me quite doubtful whether we fully understand the bodily structure of *Draconema*. The form of the head and neck and other parts do not seem to be explained merely on the basis of the use of these two "sticky" soles in locomotion. There probably are other unknown factors playing a part in the activities of *Draconema* that will further explain its highly peculiar and interesting structure.[2]

[2] *Nomenclature.* The proposal of the genus *Draconema* in 1913 appears reasonable in view of the fact that at that time the published descriptions of the species belonging to its family, though in no case as complete as desirable, indicated the existence of two (or more) genera, the type species of one of which should be that originally named by Claparède *Chaetosoma ophiocephalum* 1863 (not *Chaetosoma* Westwood, 1851, Coleoptera). *Draconema cephalatum*, was then, and continues to be, thought generically different from Claparède's *ophiocephalum*. The name *Chaetosoma*, being preëmpted, should be replaced by its synonym *Notochaetosoma* Irwin-Smith 1917. Should the opinion prevail that all the described forms of the family belong to one genus, then the oldest synonym for *Chaetosoma* would be *Draconema*, and should be substituted. In that event, the family name would naturally become *Draconematidae;* in any case, it seems likely that *Draconema* is a better representative of the group than the only other genus so far proposed, *Notochaetosoma*.

Draconema cephalatum is cosmopolitan, and seems to have been described by several different authors under as many different specific names, e.g., *annulatum* Ditlev., *haswelli* Irwin-Smith, *hibernicum* Southern.

SCIENTIFIC NOTES AND NEWS

Dr. WILLIAM BOWIE, Chief of the Division of Geodesy of the U. S. Coast and Geodetic Survey, and Comdr. N. H. HECK, Chief of the Division of Terrestrial Magnetism and Seismology of the same bureau, have been elected alumni members of the Sigma Xi Chapter at Lehigh University.

Dr. F. S. BRACKETT has joined the Smithsonian Institution to undertake studies in the correlation between wavelengths and intensities of radiation and the growth of plants, and also fundamental investigations of the chemical relations of radiation such as may throw light upon the problem of so-called photosynthesis. Dr. O. R. WULF, of the Fixed Nitrogen Research Laboratory, is also associated with the Institution in the study of methods of measurement of ultra-violet rays useful for the prevention and cure of rickets in human beings and animals.

Dr. C. U. CLARK, formerly assistant professor at Yale University, will undertake for the Smithsonian Institution, beginning in September, research in the archives of Spain with reference to documents and artifacts relating to the aborigines of the Americas and more particularly the Mayas and Toltecs of Central America.

The U. S. National Museum has received the large and valuable collection of Lepidoptera of the Brooklyn Museum as a permanent deposit. This deposit has been made because of a change of policy on the part of the Brooklyn Museum, which will devote its facilities entirely to exhibit collections. There are included in the collection some 66,000 specimens, of which 650 are types.

Dr. J. M. ALDRICH, Associate Curator of the Division of Insects of the National Museum is in Europe for the purpose of examining muscoid types at several museums and of making collections in northern Norway and Sweden, particularly of Diptera, for comparison with similar forms occurring in the northern part of North America.

Mr. CARL HEINRICH, of the Bureau of Entomology, is in Guatemala investigating a reported occurrence of the corn-borer.

The National Museum has recently acquired, through the Roebling Fund, a large cone-shaped iron meteorite weighing 1060 pounds from the Zuni Mountains, 40 miles south of Grants, New Mexico.

Dr. J. W. GIDLEY, of the Division of Vertebrate Paleontology of the National Museum, has recently returned from Melbourne, Florida, where he continued excavations in connection with his study of the Pleistocene fauna and evidence of early man. Mr. C. W. GILMORE, Curator of the same Division of the Museum, is in charge of a party collecting Upper Cretaceous vertebrates in the San Juan Basin, northwest New Mexico.

Dr. R. ENDO, of the Educational College, South Manchuria Railroad, Moukden, has recently arrived at the National Museum with collections of Lower Paleozoic fossils that he plans to study during the next two years.

Dr. F. H. H. ROBERTS, of the Bureau of American Ethnology, will make during the summer a reconnaissance in the Zuni area of New Mexico and will excavate a series of early Pueblo ruins 60 miles west of the modern pueblo of Zuni. Dr. J. N. B. HEWITT, of the same Bureau, is in Canada for the purpose of completing his ethnologic and linguistic studies relating to the League of the Iroquois and to complete translations of certain Chippewa texts.

Dr. LUCIANO J. MORAES of the Geological Survey of Brazil, has spent some weeks in Washington in a study of the organization of geologic work in the federal bureaus, museums, and other institutions.

Dr. GEORGE P. MERRILL, Head Curator of Geology at the U. S. National Museum, was the honor guest at a dinner given by his friends and associates on the occasion of his seventy-fifth birthday, May 31, 1929. C. G. ABBOT, Secretary of the Smithsonian Institution presided and brief addresses were made by Drs. MARCUS A. BENJAMIN, L. O. HOWARD, H. S. WASHINGTON, and H. W. WILEY. Miss MARGARET MOODEY presented to Dr. Merrill a volume containing letters of congratulation from some 160 friends. Dr. Merrill has been connected with the National Museum since 1881.

FRANK REEVES, of the U. S. Geological Survey, is on leave for the period May 15 to December 15, 1929, to engage in private work for an oil company in Canada.

Obituary

CAREY V. HODGSON, geodesist of the Coast and Geodetic Survey and a member of the ACADEMY, was drowned May 20, 1929, during a storm on Chesapeake Bay. He was born at Wilmington, Ohio, July 11, 1880, attended Wilmington College and Haverford College, Ohio, and shortly after his graduation in 1904 joined the Coast and Geodetic Survey. He became assistant chief of the division of Geodesy in 1920 and served in that capacity since. During the war he was a major in the Corps of Engineers and saw service overseas. His chief interest was in geodetic astronomy and surveying.

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